The Use of Pulse Oximetry To Assess the Accuracy of Chest Compressions

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Introduction

With the rapid improvement of pulse oximetry technology, new applications for the continuous, noninvasive monitoring of arterial oxygen saturation are becoming known. An unintended test of pulse oximetry's ability to monitor the chest compressions of a neonate during resuscitation attempts was performed during a comparative device trial of two next generation pulse oximeters, the Masimo SET Radical v3 and the Tyco-Nellcor N-595.

Case Study Initial Findings

During the comparative device trial, Masimo sensors connected to Masimo Radicals, and Nellcor sensors connected to Nellcor N-595s, were placed on different post-ductal extremities of each infant. An 8-month old, former 26 weeks gestation infant had an episode of severe bronchospasm with desaturation, which led to profound vasovagal stimulation and bradycardia. Both pulse oximeters showed arterial oxygen saturation initially dropping from the 90s to the 30s. Both oximeters also matched the bradycardia as noted on the ECG monitor (<80 bpm). In accordance with AAP resuscitation guidelines, the patient then received handbag ventilation and manual chest compressions.

Case Study Results

During the ensuing 5-minute period of chest compressions, the Masimo SET Radical accurately matched the rate of administered chest compressions and then tracked the pulse rate and oxygen saturation back up to baseline levels as the resuscitation was successfully completed. The N-595 dropped out and gave no readings during the chest compressions. No other resuscitative efforts occurred during study on this or any other patient enrolled in the trial.

Discussion and Authors' Conclusions

Certain next generation pulse oximetry has been shown to effectively contribute to exacting measurement protocols. Resuscitation events, however, have no technology-based standard of care. The motion and low perfusion capabilities of Masimo SET has been shown to provide the high tolerance necessary for implementation of such a protocol. The authors' concluded, "Although the oximetry devices were not used to guide resuscitation, the use in this setting is intriguing. **If the Masimo SET technology can be used to assess the effectiveness of resuscitative efforts, it can dictate a standard of care."**